

## Abstract of the Disclosure

A method to locate a fault from one end of a section of a power line utilizing measurements of current, voltage and angles between the phases at a first end of said section. Symmetrical components of currents are calculated for the current and voltage measurement at the first end. A value of impedance is calculated for an extra link between the terminals with the impedance for the positive sequence equal to:

$$(\underline{Z}_{1LB \& AB} = \frac{\underline{Z}_{1LB} \underline{Z}_{1AB}}{\underline{Z}_{1LB} + \underline{Z}_{1AB}}) \text{ where:}$$

$\underline{Z}_{1AB}$  = impedance for the positive sequence of the extra link,

$\underline{Z}_{1LA}$  = positive-sequence impedance of the healthy line.

A compensation is determined for the shunt capacitance with the aid of an equation of the form:

$$B_2^{comp-1} (d_{comp-1})^2 + B_1^{comp-1} d_{comp-1} + B_0^{comp-1} = 0 \text{ where:}$$

$$B_2^{comp-1} = A_{2\_Re}^{comp-1} A_{00\_Im}^{comp-1} - A_{2\_Im}^{comp-1} A_{00\_Re}^{comp-1}$$

$$B_1^{comp-1} = A_{1\_Re}^{comp-1} A_{00\_Im}^{comp-1} - A_{1\_Im}^{comp-1} A_{00\_Re}^{comp-1}$$

$$B_0^{comp-1} = A_{0\_Re}^{comp-1} A_{00\_Im}^{comp-1} - A_{0\_Im}^{comp-1} A_{00\_Re}^{comp-1}.$$

The zero-sequence current is determined from the healthy line of a section of parallel power lines. A distance to a fault is calculated for the parallel line section. The distance to the fault from the first end is calculated using a quadratic equation of the form:

$$B_2 d^2 + B_1 d + B_0 = 0 \text{ where:}$$

$$B_2 = A_{2\_Re} A_{00\_Im} - A_{2\_Im} A_{00\_Re}$$

$$B_1 = A_{1\_Re} A_{00\_Im} - A_{1\_Im} A_{00\_Re}$$

$$B_0 = A_{0\_Re} A_{00\_Im} - A_{0\_Im} A_{00\_Re}.$$